

(19)



JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: 06042525 A
(43) Date of publication of application: 15.02.1994

(51) Int. Cl F16C 7/02
F16C 9/04

(21) Application number: 04197920
(22) Date of filing: 24.07.1992

(71) Applicant: NISSAN MOTOR CO LTD
(72) Inventor: USHIJIMA KENJI

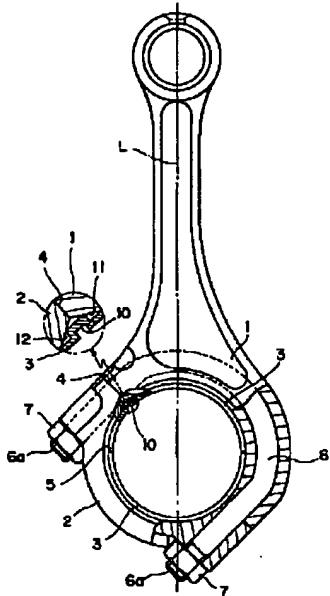
(54) CONNECTING ROD OF
INTERNAL-COMBUSTION ENGINE

COPYRIGHT: (C)1994,JPO&Japio

(57) Abstract:

PURPOSE: To accurately position a cap and a connecting rod main body without the need of any positioning pin or the like additionally, and to improve workability at the time of assembly.

CONSTITUTION: A dividing surface 4 between a connecting rod main body 1 and a cap 2 is inclined with respect to the center line L of the connecting rod, but a dividing surface 5 is orthogonal to the center line L. A projecting piece and a notch, both being engageable with each other, are formed on the ends of a bearing metal 3 in the circumferential direction thereof, and the engagement of the projecting piece with the notch causes the double bearing metal 3 to be positioned and temporarily held. A protuberance 10 that engages with both the recess 11 of the connecting rod main body 1 and the recess 12 of the cap 2 is formed on the outer peripheral surface of the bearing metal 3, whereby the cap 2 is positioned.



*** NOTICES ***

JPO and NCIPPI are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] While the parting plane of the body section of a connecting rod and a cap is aslant prepared to a connecting rod center line While the parting plane of bearing metal forms in the hoop direction edge of the above-mentioned bearing metal the piece of a projection and notch of each other for temporary assembling which can be engaged in the connecting rod of the internal combustion engine which intersects perpendicularly to a connecting rod center line The connecting rod of the internal combustion engine characterized by having formed heights in the part corresponding to the parting plane of the body section of a connecting rod of each bearing-metal peripheral face, and a cap partially so that both might be covered, and forming the crevice which fits into the above-mentioned body section of a connecting rod, and the inner skin of a cap with the above-mentioned heights.

[Claim 2] The connecting rod of the internal combustion engine according to claim 1 characterized by the bolt for cap association which fixes the above-mentioned cap being a U bolt by which the insert was carried out to the body section of a connecting rod.

[Claim 3] The connecting rod of the internal combustion engine according to claim 1 characterized by the bolts for cap association which fix the above-mentioned cap being a female screw by the side of the body section of a connecting rod, and a bolt to screw.

[Translation done.]

*** NOTICES ***

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to amelioration of an internal combustion engine's connecting rod, especially the connecting rod with which the parting plane of the body section of a connecting rod and the cap in a large end was aslant prepared to the connecting rod center line.

[0002]

[Description of the Prior Art] As shown in drawing 8, the connecting rod with which the parting plane 23 of the body section 21 of a connecting rod and the cap 22 in a large end inclined aslant to the connecting rod center line L is known (for example, JP,60-128022,U etc.). In this thing, the parting plane 25 of the bearing metal 24 and 24 made into the hemicycle 2 ****s is arranged so that it may intersect perpendicularly to the connecting rod center line L, and it is not in agreement in the above-mentioned body section 21 of a connecting rod, and the parting plane 23 of cap 22. And while the heights 26 which swelled to the periphery side are formed in the hoop direction edge of bearing metal 24 and 24, the above-mentioned heights 26 and the crevice 27 which fits in are formed in the body section 21 of a connecting rod, and the inner skin of cap 22. Bearing metal 24 and 24 is positioned by fitting of this heights 26 and crevice 27 at shaft orientations, and rotation is prevented. Moreover, in order to position the cap 22 combined with a bolt 28 to shaft orientations to the body section 21 of a connecting rod, while the gage pin 29 is implanted in the body section 21 side of a connecting rod, this gage pin 29 and the tooling holes 30 which fit in are formed in the cap 22 side.

[0003]

[Problem(s) to be Solved by the Invention] In the above-mentioned conventional configuration, since [of the body section 21 of a connecting rod, and cap 22] a gage pin 29 and tooling holes 30 are formed separately because of positioning, there is fault that cost increases. Moreover, since the bearing metal 24 of a pair and 24 comrades are not directly tacking made in the condition of it not having been positioned but moreover having doubled in the shape of a perfect circle, there is a fault that working capacity is bad.

[0004]

[Means for Solving the Problem] While the parting plane of the body section of a connecting rod and a cap is aslant prepared to a connecting rod center line, this invention While the parting plane of bearing metal forms in the hoop direction edge of the above-mentioned bearing metal the piece of a projection and notch of each other for temporary assembling which can be engaged in the connecting rod of the internal combustion engine which intersects perpendicularly to a connecting rod center line Heights are partially formed in the part corresponding to the parting plane of the body section of a connecting rod of each bearing-metal peripheral face, and a cap so that both may be covered, and it is characterized by forming the above-mentioned heights and the crevice which fits in in the above-mentioned body section of a connecting rod, and the inner skin of a cap.

[0005]

[Function] While the piece  a projection and notch of a hoop direction edge are engaged in the condition of having doubled in the shape of a perfect circle and being positioned by shaft orientations, it is mutually tacking carried out of the bearing metal of a pair. And the heights of this bearing metal fit into the body section of a connecting rod, and the crevice of a cap. Since the above-mentioned heights continue and fit into the body section of a connecting rod, and the both sides of a cap at this time, a cap is positioned by shaft orientations to the body section of a connecting rod.

[0006]

[Example] Hereafter, one example of this invention is explained to a detail based on a drawing.

[0007] Drawing 1 shows the configuration of the whole connecting rod concerning this invention. In the large end, 2 ****'s of this connecting rod are carried out to the body section 1 of a connecting rod, and cap 2, and the bearing metal 3 too made into that inner skin 2 ****'s is incorporated. To the connecting rod center line L, the parting plane 4 of the above-mentioned body section 1 of a connecting rod and cap 2 inclines aslant, and is prepared. On the other hand, in order that planar pressure may avoid the part which becomes high, the parting plane 5 of bearing metal 3 is formed so that it may intersect perpendicularly to the connecting rod center line L. Moreover, in this example, the insert of U bolt 6 is carried out to the body section 1 of a connecting rod as a bolt for cap association, and the nut 7 is screwing in male screw section 6a which penetrated the cap 2, respectively. Although few gaps for error absorption are between this U bolt 6 and the through tube of cap 2 and cap 2 moves somewhat, where cap 2 is combined with the body section 1 of a connecting rod with the above-mentioned nut 7, machining of inner skin is made by both one.

[0008] Bearing metal 3 is making the hemicycle, as shown in drawing 2, and the notch 9 is formed in another side for the piece 8 of a projection for temporary assembling at one side of the hoop direction edge. It has extended that it is also at constant width S1 in the shape of an abbreviation rectangle, and stop section 8a is prepared in the point right and left, respectively so that the above-mentioned piece 8 of a projection might be extended along with the radii of bearing metal 3 and may be ***^(ed) to drawing 3. This about several 10 micrometers stop section 8a is projected crosswise rather than side-face 8b of the piece of projection 8 general section. And the inside of stop section 8a cuts and lacks, and each stop section 8a can bend and deform now into the inside. Moreover, the notch 9 of another side has become taper-like, in order that it may cut to an abbreviation rectangle that it is also at the same width of face S1 as the piece 8 of a projection, and it may lack and the opening 9a may guide stop section 8a so that it may *** to drawing 4. Moreover, crevice 9b with which the above-mentioned stop section 8a can engage is formed in right and left in the form which spread in the hemicycle at the pars-basilaris-ossis-occipitalis side of a notch 9. In addition, the die length S3 of this notch 9 is slightly set up short from the die length S2 of the piece 8 of a projection.

[0009] Therefore, if the piece 8 of a projection presses fit in a notch 9, since stop section 8a of the piece 8 of a projection will bend to the inside and the bearing metal 3 of the pair which makes the same configuration will spread and engage with right and left by crevice 9b, it is mutually combined with one. That is, it will be correctly positioned by shaft orientations and will be tacking carried out to coincidence.

[0010] Moreover, the heights 10 of a projection rectangle are formed in a part of side edge of each bearing metal 3 to the periphery side. These heights 10 are formed in the part corresponding to the parting plane 4 of the body section 1 of a connecting rod, and cap 2, and they are formed so that it may be especially continued and located in the both sides of the body section 1 of a connecting rod, and cap 2. And as shown in drawing 5, in the hoop direction edge, the crevice 11 into which some above-mentioned heights 10 fit is aslant formed in the inner skin of the body section 1 of a connecting rod. Moreover, as shown in drawing 6, in the hoop direction edge, the crevice 12 into which some above-mentioned heights 10 fit is aslant formed in the inner skin of cap 2. The crevice 11 by the side of

BEST AVAILABLE COPY

the above-mentioned body section 1 of a connecting rod and the crevice 2 by the side of cap 2 are mutually united in both integrated state, and the heights 10 whole fits in. In addition, after the above-mentioned crevices 11 and 12 process inner skin where cap 2 is combined with the body section 1 of a connecting rod as mentioned above, they are machined by both one.

[0011] In order to attach in the crank pin which does not illustrate the connecting rod constituted as mentioned above, the bearing metal 3 of a pair is allotted and the piece 8 of a projection and the notch 9 of each other are made to press fit on both sides of a crank pin first. Thereby, it is tacking carried out of the bearing metal 3 of a pair. And the body section 1 of a connecting rod and cap 2 are combined, making it the heights 10 of this bearing metal 3 agree in crevices 11 and 12, and a nut 7 is bound tight, and both are combined. That is, with the above-mentioned configuration, since positioning of the shaft orientations of both the bearing metal 3 is made correctly and the body section 1 of a connecting rod and cap 2 are positioned by association with the piece 8 of a projection, and a notch 9 on the basis of the heights 10 of the pair of the bearing metal 3 of a parenthesis, the body section 1 of a connecting rod and cap 2 are kept right to the integrated state at the time of performing processing of inner skin or crevices 11 and 12. Therefore, an exceptional positioning means like the conventional gage pin is unnecessary, and since it can tacking do of the bearing-metal 3 comrades, workability improves sharply. Moreover, rotation of bearing metal 3 is prevented by fitting of heights 10 and crevices 11 and 12.

[0012] Next, the example from which this invention differs is shown, in this example, the hexagon-headed bolt 13 of a pair is used as a bolt for cap association, and this penetrates cap 2, and drawing 7 is screwing it in the female screw 14 by the side of the body section 1 of a connecting rod. Also in this case, although few gaps are between a bolt 2 and the through tube of cap 2, the body section 1 of a connecting rod and cap 2 are correctly positioned by engagement of the piece 8 of a projection, and a notch 9, and fitting of heights 10 and crevices 11 and 12 like the example mentioned above.

[0013]

[Effect of the Invention] Since the body section of a connecting rod and a cap are correctly positioned at the same time the baffle of the bearing metal is carried out by fitting of the heights of a bearing-metal peripheral face, and the body section of a connecting rod and the crevice of a cap in the connecting rod of the internal combustion engine applied to this invention so that clearly by the above explanation, the exceptional positioning means of a conventional gage pin and tooling holes becomes unnecessary, and simplification of a configuration and reduction of cost can be aimed at. Moreover, since the bearing metal of a pair can hold in the state of temporary assembling which sandwiched the crank pin, working capacity improves.

[Translation done.]

BEST AVAILABLE COPY